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EXAMINER

JAGANNATHAN, MELANIE

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte AVINASH JAIN, MOHAMMAD HOSSEIN
TAGHAVI NASRABADI, and HEMANTH SAMPATH

Appeal 2016-001604
Application 13/018,618
Technology Center 2400

Before ROBERT E. NAPPI, SCOTT B. HOWARD, and
STEVEN M. AMUNDSON, *Administrative Patent Judges*.

AMUNDSON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants¹ seek our review under 35 U.S.C. § 134(a) from a final rejection of claims 1–20, 22–41, 43–62, 64, and 65.² We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

¹ According to Appellants, the real party in interest is QUALCOMM Incorporated. App. Br. 3.

² Claims 21, 42, and 63 “are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form” Final Act. 15.

STATEMENT OF THE CASE

The Invention

According to the Specification, the invention relates to “transmitting an allocation of time to one or more apparatuses in a wireless network.” Spec. ¶ 2.³ The Specification explains that “[t]he allocation of time may be based on information regarding an apparatus known to be located in [a] receive beam direction” and that “[a] unique time for receiving communications from each known apparatus may be allocated, or a duration of time for receiving communications from the known apparatuses may vary based on a number of apparatuses known to located in a receive beam direction.” Abstract.

Exemplary Claim

Independent claim 1 exemplifies the subject matter of the claims under consideration and reads as follows:

1. An apparatus for wireless communication, the apparatus comprising:
 - a receiver configured to receive communications via a plurality of receive beam directions; and
 - a transmitter configured to communicate an allocation of time for one or more of the receive beam directions,
 - wherein the allocation of time for each of the one or more receive beam directions is based at least in part on information regarding one or more apparatuses known to be located in each

³ This decision uses the following abbreviations: “Spec.” for the Specification, filed February 1, 2011; “Final Act.” for the Final Office Action, mailed December 15, 2014; “Adv. Act.” for the Advisory Action, mailed February 23, 2015; “App. Br.” for the Appeal Brief, filed May 5, 2015; “Ans.” for the Examiner’s Answer, mailed September 23, 2015; and “Reply Br.” for the Reply Brief, filed November 20, 2015.

respective receive beam direction of the one or more of the
receive beam directions.

App. Br. 32 (Claims App.).

The Prior Art Supporting the Rejections on Appeal

As evidence of unpatentability, the Examiner relies on the following
prior art:

Müller	US 6,438,375 B1	Aug. 20, 2002
Gorokhov	US 2007/0271568 A1	Nov. 22, 2007
Singh et al. ("Singh")	US 2009/0046653 A1	Feb. 19, 2009
Yong et al. ("Yong")	US 2009/0238156 A1	Sept. 24, 2009
Cordeiro et al. ("Cordeiro")	US 2010/0103885 A1	Apr. 29, 2010
Chou	US 2011/0038355 A1	Feb. 17, 2011 (filed Nov. 5, 2010)
Shao et al. ("Shao")	US 8,265,657 B2	Sept. 11, 2012 (filed May 10, 2007)

The Rejections on Appeal

Claims 1–3, 5–11, 13, 14, 16–19, 22–24, 26–28, 30–32, 34–40,
43–45, 47–49, 51–56, 58–61, 64, and 65 stand rejected under 35 U.S.C.
§ 103(a) as unpatentable over Cordeiro and Shao. Final Act. 3–11;
Ans. 3–11.

Claims 20, 41, and 62 stand rejected under 35 U.S.C. § 103(a) as
unpatentable over Cordeiro, Shao, and Singh. Final Act. 11–12; Ans. 11–12.

Claims 4, 25, and 46 stand rejected under 35 U.S.C. § 103(a) as
unpatentable over Cordeiro, Shao, and Gorokhov. Final Act. 12–13;
Ans. 12–13.

Claims 12 and 33 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cordeiro, Shao, and Yong. Final Act. 13–14; Ans. 13–14.

Claims 15, 36, and 57 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cordeiro, Shao, and Chou. Final Act. 14; Ans. 14.

Claims 29 and 50 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cordeiro, Shao, and Muller.⁴ Final Act. 14–15; Ans. 14–15.

ANALYSIS

We have reviewed the rejections of claims 1–20, 22–41, 43–62, 64, and 65 in light of Appellants’ arguments that the Examiner erred. For the reasons explained below, we agree in part with Appellants’ assertions regarding error by the Examiner.

The Rejection of Claims 1–3, 5–11, 13, 14, 16–19, 22–24, 26–28, 30–32, 34–40, 43–45, 47–49, 51–56, 58–61, 64, and 65 Under 35 U.S.C. § 103(a)

AN “ALLOCATION OF TIME” BASED ON “INFORMATION REGARDING” AN APPARATUS “KNOWN TO BE LOCATED IN” A “RECEIVE BEAM DIRECTION”

Appellants argue that the Examiner erred in rejecting independent claims 1, 22, 43, 64, and 65 because:

Cordeiro in view of *Shao* does not teach, show, or suggest that “the allocation of time for each of the one or more receive beam directions is based at least in part on information regarding one or more apparatuses known to be located in each respective

⁴ Although the rejections in the Final Office Action cite US 8,265,657 B2, both the Examiner and Appellants refer to various paragraphs in the corresponding patent application publication, i.e., US 2008/0095072 A1 to Shao et al. See, e.g., Final Act. 3–4; App. Br. 13–14; Ans. 3–4, 18. For consistency, this decision will also refer to various paragraphs in US 2008/0095072 A1.

receive beam direction of the one or more of the receive beam directions” as recited in independent claims 1, 22, 43, 64, and 65.

App. Br. 13 (emphasis omitted).

In particular, Appellants contend that Cordeiro’s bandwidth allocation “is based on a bandwidth allocation request” from an apparatus rather than “information regarding” an apparatus. App. Br. 13–14 (citing Cordeiro ¶ 26); Reply Br. 3. As for Shao, Appellants concede that Shao teaches determining location information for an apparatus but contend that Shao “is silent with respect to an allocation of time being based at least in part on this location information.” App. Br. 14 (citing Shao ¶¶ 19, 28, 59); Reply Br. 3, 7. Appellants also contend that Shao’s bandwidth allocation “is based on bandwidth reservation requests and responses” rather than “information regarding” an apparatus “known to be located in” a “receive beam direction.” App. Br. 14 (citing Shao ¶¶ 63–64); *see* Reply Br. 4 (citing Shao ¶¶ 56, 63–64).

Appellants’ contentions do not persuade us of Examiner error because the Examiner relies on the combined teachings of Cordeiro and Shao for the disputed limitation. Ans. 3–4, 16–18; *see* Final Act. 3–4, 16–17; Adv. Act. 2. The Examiner finds that Cordeiro teaches “the allocation of time for each of the one or more receive beam directions” according to the claims. Ans. 17–18. The Examiner additionally finds that Cordeiro discloses a controller in a wireless network “communicating with devices in the network that are beam directed to the” controller. Adv. Act. 2 (citing Cordeiro ¶¶ 24, 26, 30, 32, Fig. 1); *see* Final Act. 3–4; Ans. 3–4. For instance, Cordeiro instructs that transmissions between the devices and the controller “may take place in the directional mode using beamforming

techniques.” Cordeiro ¶ 30; *see id.* Fig. 1 (showing beamformer 124 in controller 120 and beamformer 134 in device 130). The Examiner also finds that “the controller allocates a channel (i.e. time)” after receiving a device’s bandwidth allocation request. Ans. 17; *see* Adv. Act. 2; *see also* Final Act. 3–4, 16.

Further, the Examiner finds that Shao teaches “information regarding one or more apparatuses known to be located in each respective receive beam direction of the one or more of the receive beam directions” according to the claims. Ans. 17–18; *see* Final Act. 4; Adv. Act. 2. The Examiner additionally finds that Shao discloses device discovery including location determination in a wireless network with a coordinator and multiple devices. Ans. 4, 17 (citing Shao ¶¶ 19, 32–33, Abstract); *see* Final Act. 4, 16–17; Adv. Act. 2. More specifically, Shao explains that a coordinator or device “can measure and compare the signal quality” and “based on such measurement and comparison” determine the direction of the device relative to the coordinator “as location information.” Shao ¶ 33; *see* Final Act. 4, 16; Ans. 4; Adv. Act. 2. Shao then explains that the coordinator “maintains the location information for each associated device” and each associated device “also maintains the location information for itself and other devices” Shao ¶ 33.

For direct link transmissions between devices in Shao, the Examiner finds that Shao’s coordinator provides channel access for the devices based on device location. Ans. 17–18, 19–20 (citing Shao ¶¶ 39, 47); *see* Final Act. 16–17 (citing Shao ¶ 47); Adv. Act. 2 (citing Shao ¶¶ 63–64). In particular, Shao teaches that (1) “device location information can be utilized for direct link transmission,” (2) the “coordinator . . . provides location

information” to devices for direct link transmission, and (3) the coordinator provides channel access and reserves channel time blocks for devices that directly communicate. Shao ¶¶ 39, 47, 59, 63–64; *see* App. Br. 14 (citing Shao ¶¶ 19, 28, 59); Reply Br. 3 (citing Shao ¶¶ 19, 28, 59, 68). The Examiner reasons that “the combination of Cordeiro’s time allocation between controller and devices and Shao’s controller’s [coordinator’s] device discovery to determine device location to provide channel access” corresponds to the claimed “allocation of time based on at least in part on apparatuses known to be located.” Ans. 18 (emphasis omitted); *see* Adv. Act. 2.

Appellants argue that “any allocation of time described in *Shao* is not based on the location information of *Shao*” App. Br. 15; Reply Br. 4, 7. But that argument disregards the coordinator’s role in direct link transmission as discussed above, e.g., providing location information and channel access. That argument also disregards Shao’s disclosure that a “beam-searching/steering process” may obtain “accurate link status information” used to “set proper transmission/reception configurations” before starting direct link transmission. Shao ¶¶ 60–61, 63–64, 66. Shao explains that transmission/reception configurations include time allocations. *Id.* ¶ 55. Thus, location information from the “beam-searching/steering process” also affects time allocations.

Appellants additionally argue that “the location information in *Shao* is determined after ‘obtaining the reserved bandwidth.’” Reply Br. 4 (quoting Shao ¶ 64); *see id.* at 7 (citing Shao ¶¶ 56, 63–64). That argument disregards Shao’s disclosure that (1) location map set-up constitutes an initial association stage for communication among the coordinator and

devices and involves direction determinations and (2) the coordinator “maintains the location information for each associated device” after set-up. Shao ¶¶ 30, 32–33.

THE PROPRIETY OF COMBINING CORDEIRO AND SHAO

Appellants assert that “the Examiner fails to provide sufficient rationale for the Examiner’s purported combination of” Cordeiro and Shao. App. Br. 14. Appellants similarly assert that “the Examiner has failed to provide an ‘articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.’” *Id.* at 15 (quoting *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007)).

But the Examiner finds, and we agree, that both Cordeiro and Shao concern bandwidth allocation for communication in a beamforming setting and that the motivation to combine comes from Shao’s disclosure concerning efficient device discovery in a wireless network. Ans. 4, 18–19 (citing Shao ¶ 6); Final Act. 4, 17 (citing Shao ¶ 6). “[T]he desire to enhance commercial opportunities by improving a product or process is universal” *DyStar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006). “[A]n implicit motivation to combine” may result from a desire to make a product or process “stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient.” *Id.* Thus, we discern no error in the Examiner’s determination that “it would have been obvious to combine Cordeiro’s disclosure of” a “controller communicating with devices in the network that are beam directed to the . . . controller and subsequent channel bandwidth allocation with Shao’s teaching of communication between the coordinator and devices to determine direction

and location of the devices to provide bandwidth allocation for communication.” Adv. Act. 2.

In the Reply Brief, Appellants argue that the Examiner’s rationale for combining Cordeiro and Shao falls under *Manual of Patent Examining Procedure* (MPEP) § 2143(I)(A), i.e., “[c]ombining prior art elements according to known methods to yield predictable results.” Reply Br. 5. Appellants then argue that the Examiner has not made sufficient findings according to the MPEP. *Id.* at 6. Appellants’ MPEP-based arguments do not, however, respond to any arguments in the Answer. *See* Ans. 18–19. Appellants present them for the first time in the Reply Brief. Such arguments “will not be considered by the Board” unless an appellant shows good cause. *See* 37 C.F.R. § 41.41(b)(2); *see also Ex parte Borden*, 93 USPQ2d 1473, 1475 (BPAI 2010) (“informative”) (discussing procedural difficulties with belated arguments). Here, Appellants have not shown good cause for belatedly presenting their MPEP-based arguments. Thus, we decline to consider them.

THE COMBINATION OF CORDEIRO AND
SHAO YIELDS THE CLAIMED INVENTION

Appellants argue that “the purported combination [of Cordeiro and Shao] would not yield the claimed invention.” App. Br. 15. Appellants assert that “it is difficult to see how or why the dynamic bandwidth allocation in *Cordeiro* would be modified to be based on the location information of *Shao*, rather than on a channel bandwidth allocation request.” *Id.* As explained above, however, the Examiner appropriately combined “Cordeiro’s disclosure of” a “controller communicating with devices in the network that are beam directed to the . . . controller and subsequent channel

bandwidth allocation” and “Shao’s teaching of communication between the coordinator and devices to determine direction and location of the devices to provide bandwidth allocation for communication.” Adv. Act. 2; *see* Ans. 19–20.

SUMMARY FOR INDEPENDENT CLAIMS 1, 22, 43, 64, AND 65

For the reasons discussed above, Appellants’ arguments have not persuaded us that the Examiner erred in rejecting claims 1, 22, 43, 64, and 65 for obviousness based on Cordeiro and Shao. Hence, we sustain the rejection.

DEPENDENT CLAIMS 2, 3, 6–11, 13, 14, 16–19, 23, 24,
27, 28, 30–32, 34–40, 44, 45, 48, 49, 51–56, AND 58–61

Appellants do not present any separate patentability arguments for dependent claims 2, 3, 6–11, 13, 14, 16–19, 23, 24, 27, 28, 30–32, 34–40, 44, 45, 48, 49, 51–56, and 58–61. App. Br. 10–16; Reply Br. 2–7. Because Appellants do not argue these dependent claims separately, they stand or fall with the associated independent claims. *See* 37 C.F.R. § 41.37(c)(1)(iv). Hence, we sustain the rejection of these dependent claims.

DEPENDENT CLAIMS 5, 26, AND 47

Dependent claims 5, 26, and 47 specify that “the information regarding one or more apparatuses comprises a quantity of apparatuses known to be located in each of the one or more of the receive beam directions.” App. Br. 33, 36, 40 (Claims App.). Thus, these dependent claims require an “allocation of time . . . based at least in part on” a “quantity of apparatuses known to be located in” a “receive beam direction.” Appellants argue that Cordeiro and Shaw do not “teach, show, or suggest”

an “allocation of time being based at least in part on a quantity of apparatuses.” App. Br. 18–19.

The Examiner finds that Shao discloses that the coordinator “maintains the location information for the devices relative to the coordinator,” and “thus Shao discloses the location of the one or more other devices i.e. information comprising a quantity of apparatuses known to be located.” Ans. 20–21; *see* Final Act. 17; Adv. Act. 2. Although that finding addresses the determination of a “quantity of apparatuses,” it does not address the requirement for an “allocation of time . . . based at least in part on” a “quantity of apparatuses.” Consequently, the Examiner has not, given the record before us, adequately explained how the cited portions of Cordeiro and Shaw teach or suggest the subject matter of claims 5, 26, and 47. Hence, we do not sustain the rejection of claims 5, 26, and 47.

*The Rejections of Claims 4, 12, 15, 20, 25, 29, 33,
36, 41, 46, 50, 57, and 62 Under 35 U.S.C. § 103(a)*

Appellants dispute the rejections of dependent claims 4, 12, 15, 20, 25, 29, 33, 36, 41, 46, 50, 57, and 62. App. Br. 19–30; Reply Br. 7. Although Appellants identify the claim limitations at issue, Appellants do not explain how those limitations distinguish over Cordeiro, Shao, or any additionally cited reference. App. Br. 19–30; *see* Reply Br. 7. Referring serially to Singh, Gorokhov, Yong, Chou, and Müller, Appellants assert that the additionally cited reference fails to overcome the alleged deficiencies in Cordeiro and Shao with regard to the associated independent claims. App. Br. 21–30; *see* Reply Br. 7. Because Appellants do not argue these dependent claims separately, they stand or fall with the associated independent claims. *See* 37 C.F.R. § 41.37(c)(1)(iv); *see also In re Lovin*,

652 F.3d 1349, 1356–57 (Fed. Cir. 2011). Hence, we sustain the rejections of these dependent claims.

DECISION

We affirm the Examiner’s decision to reject claims 1–4, 6–20, 22–25, 27–41, 43–46, 48–62, 64, and 65.

We reverse the Examiner’s decision to reject claims 5, 26, and 47.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART